LISTING OF CLAIMS

This listing of claims will replace all prior versions and listings of claims in the above-referenced application. This listing is provided for the convenience of the Examiner only as no claims amendments have been proposed herein.

Claims 1-20 (Cancelled)

21. (Previously presented) A guitar preamplifier, comprising:

electronic filters having at least two stages for splitting an input signal into two or more separate frequency bands each having a different center frequency, said filters comprising a substantially equi-phase response wherein a phase response of each stage is substantially identical for each frequency band;

two or more non-linear circuits, each of which distorts one of the frequency bands; and

a summing network for recombining said frequency bands.

22. (Previously presented) A guitar preamplifier according to claim 21, wherein said filters comprise a cascade of 2^N - 1 pairs of even-poled low and high pass filters arranged such that each pair splits the incoming frequency band in two, where N is the number of stages of pairs in the cascade, and wherein for the nth stage subsequent to the first, each low or high pass filter pair is preceded by (2^{n-1} - 1) all pass filters with phase response corresponding to the (2^{n-1} - 1) other low and high pass filter phase response in that stage such that the phase response of each stage is similar for each frequency band.

23. (Previously presented) A guitar preamplifier according to claim 22, wherein said cascade has two stages of two pole low and high pass filter pairs.

24. (Previously presented) A guitar preamplifier according to claim 21, wherein each low and high pass filter pair is a state variable filter.

25. (Previously presented) A guitar preamplifier according to claim 22, wherein each low and high pass filter pair is a state variable filter.

26. (Previously presented) A guitar preamplifier according to claim 21, wherein said filters further comprise variable cross-mixing after one or more stages of said filters.

27. (Previously presented) A guitar preamplifier according to claim 26, wherein said filters further comprise variable cross-mixing after one or more stages of said filtering means.

28. (Previously presented) A guitar preamplifier according to claim 26, further comprising low pass filters after said non-linear circuits to reduce high frequency distortion products.

29. (Previously presented) A guitar preamplifier according to claim 28, wherein said filters are combined with said summing network such that in successive stages the lowest frequency band is low pass filtered with a low pass filter and the other frequency bands are all pass filtered with an all pass filter corresponding to said low pass filter, said lowest frequency band is then combined with the next lowest frequency band, and comprising subsequent stages of repeated filtering and combining until all frequency bands are combined, such that the phase response over all frequency bands through the low pass filtering and summing network is identical.

30. (Previously presented) A guitar preamplifier according to claim 21, wherein said non-linear circuit for each frequency band has a different gain than those in the other frequency bands.

31. (Previously presented) A guitar preamplifier according to claim 21, wherein said non-linear circuits for higher frequency bands have a higher minimum gain than the non-linear circuits for lower frequency bands.

32. (Previously presented) A guitar preamplifier according to claim 21, wherein the distortion by said non-linear circuits is variable.

33. (Previously presented) A digital musical instrument preamplifier comprising:

digital electronic filters having at least two stages for splitting an input sampled signal into two or more separate output frequency bands each having a different center frequency, said filters comprising a substantially equi-phase response wherein a phase response of each stage is substantially identical for each frequency band;

two or more non-linear digital circuits, each of which distorts one of the output frequency bands; and

a digital summing network for recombining said frequency bands.

34. (Previously presented) A digital musical instrument preamplifier according to claim 33, wherein said digital filters comprise a cascade of 2^N - 1 pairs of even poled low and high pass filters arranged such that each pair splits the incoming frequency band in two, where N is the number of stages of pairs in the cascade, and wherein for the nth stage subsequent to the first, each low or high pass digital filter pair is preceded by $(2^{n-1} - 1)$ all pass digital filters with phase response corresponding to the $(2^{n-1} - 1)$ other low and high pass digital filter phase response in that stage such that the phase response of each stage is similar for each frequency band.

35. (Previously presented) A digital musical instrument preamplifier according to claim 34 wherein each digital low pass and high pass filter is obtained by a bilinear transformation of a corresponding low pass and high pass analogue filter, and the all pass filters are obtained by a bilinear transformation of a corresponding all pass analogue filter.

36. (Previously presented) A digital musical instrument preamplifier according to claim 33 wherein said digital filters comprise linear phase finite impulse response filters.

37. (Previously presented) A digital musical instrument preamplifier according to claim 33 wherein said digital filters further comprise variable digital cross-mixing after one or more stages of said digital filters.

38. (Previously presented) A digital musical instrument preamplifier according to claim 37 further comprising digital low pass filters after said digital non-linear circuits to reduce high frequency distortion products.

39. (Previously presented) A digital musical instrument preamplifier according to claim 38 wherein said digital low pass filters are combined with said summing network such that in successive stages the lowest frequency band is low pass filtered with a digital low pass filter and the other frequency bands are all-pass filtered with a digital all-pass filter corresponding to said digital low-pass filter, said lowest frequency band is then combined with the next lowest frequency band, and comprising subsequent stages of repeated digital filtering and combining until all frequency bands are combined, such that the phase response over all frequency bands through the digital low pass filtering and summing network is identical.

40. (Previously presented) A musical instrument preamplifier, comprising:

a) electronic filters including a first filter network, the network including:

an input,

a plurality of outputs, and

a plurality of band splitter filters to split a signal on the input into a plurality of different, substantially equi-phase frequency bands in which frequency bands of substantially any frequency passed by more than one of said band splitter filters are substantially in phase in all of said bands;

and

b) a plurality of non-linear circuits coupled to a plurality of the outputs to distort respective output frequency bands.

41. (Previously presented) A musical instrument preamplifier system, comprising:

electronic filters for splitting an input signal into a plurality of different, substantially equi-phase frequency band outputs in which frequency bands of substantially any frequency passed by a plurality of band splitter filters are substantially in phase in all of said bands, and

a plurality of non-linear circuits coupled to said filters to distort respective output frequency bands,

wherein the filters include a cascade of a first filter network, and one or more subsequent filter networks, each network including:

an input,

a plurality of outputs, and

said plurality of band splitter filters to split a signal on the input into a plurality of different frequency bands for the outputs,

wherein for one or more of the subsequent networks, the input of each is coupled to one output of another network via a filter to provide substantially equi-phase frequency bands on the network's outputs,

and wherein outputs of some of the networks form frequency band outputs of the filters.